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COCAINE IN THE STUDY OF POND-LIFE.

H. N. Conser, Sunbury, Pa.

Hydrochlorate of cocaine as a narcotic for forms of aquatic life has a special value in the study of bryozoans and the encased rotifers. Quick-killing methods cannot be used where the contractile organs are so well protected as in these forms, neither can the narcotics that kill, for they often allow disorganization of cilia and tentacles before other parts of the organism are sufficiently benumbed.

The method I have found most satisfactory and certain with the fresh water Bryozoa is as follows: Several colonies are placed in a solid watch glass with 5 cc. of water, and as soon as the animals have expanded one or two centigrams of cocaine is dropped on the edge of the water at two or three distant points. In fifteen minutes the narcotic influence is sufficient, as can be tested by touching the tentacles with a needle. One per cent. chromic acid is now poured in to fill the watch glass and left to act for half an hour or more when it is nearly all withdrawn and water substituted. This process is repeated in half an hour, and alcohol to form about twenty-five per cent. added to the water, the strength of alcohol is increased by the addition of ninety-five per cent. until eighty per cent. is reached. By this means the chromic acid is washed out and the hardening accomplished so gradually that no distortions occur. For staining, borax-carmine or alcoholic-cochineal is used. The clearing must be gradual and is best accomplished by adding oil of lavender to the ninety-five per cent. alcohol in which the animals are kept, and after an hour, bringing them into oil of lavender from which, after perfect clearing, they are mounted in balsam.

The free swimming rotifers readily succumb to the influence of cocaine, but the family Melicertadæ hold out a long time against it. A method for these is like that for the bryozoans with the exception that only sufficient water to cover the colony well, need be used; the quantity of cocaine must be relatively large, and when all movements cease, killing may be done with twenty per cent. formalin, as chromic acid precipitates cocaine, when present in any considerable quantity. An after treatment with chromic acid in one-half per cent. seems to give better hardening than formalin alone. When a colony of the Melicertadæ is subjected for fifteen minutes to a half per cent cocaine solution and then transferred to another watch glass with pond water, the individual rotifers come out of the tubes and attach themselves hydra-like to the bottom of the glass in perfect condition for study, thus saving the trouble of freeing the animals from the tubes with needles.